GEORGIA INSTITUTE OF TECHNOLOGY — OFFICE OF CONTRACT ADMINISTRATION

PROJECT ADMINISTRATION DATA SHEET

[x] ORIGINAL [ ] REVISION NO. ____

Project No. A-3502 — GTRI/~~GIT~~ — DATE 7 / 20 / 83

Project Director: N. C. Currie — ~~School~~/Lab RAIL-IMD

Sponsor: Canadian Dept. of Supply & Services

Type Agreement: Contract No. 01SE.FP921-2-0090

Award Period: From 2/22/83 To 4/15/83 (Performance) --- (Reports)

Sponsor Amount:	This Change	Total to Date
Estimated:	$ 62,771	$ 62,771
Funded:	$ 62,771	$ 62,771

Cost Sharing Amount: $ None — Cost Sharing No: N/A

Title: Radar Support for RCS Measurements of Sea Ice

ADMINISTRATIVE DATA

OCA Contact William F. Brown Ext. 4820

1) Sponsor Technical Contact:

Mr. E. Lewis
Dept of Fisheries & Oceans
867 Lakeshore Rd., P.O. Box 5050
Burlington, Ontario
L7R 4A6

2) Sponsor Admin/Contractual Matters:

Mr. F. S. Thomas, Science Proc. Mgr.
Science Procurement Section
Ontario Region Supply Centre
295 the West Mall, Suite 200
ETOBICOKE, Ontario
M9C 5A4

Defense Priority Rating: N/A — Military Security Classification: N/A

(or) Company/Industrial Proprietary: ____

RESTRICTIONS

See Attached ---- Supplemental Information Sheet for Additional Requirements.

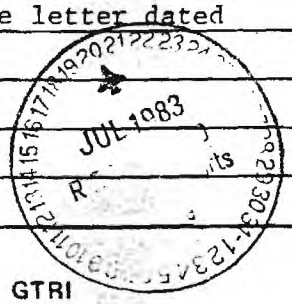
Travel: Foreign travel must have prior approval – Contact OCA in each case. Domestic travel requires sponsor approval where total will exceed greater of $500 or 125% of approved proposal budget category.

Equipment: Title vests with GTRI but none proposed.

COMMENTS:

See Copyright restrictions as discussed in GTRI contract acceptance letter dated 3/10/83.

Note: Related follow-on project is A-3542.



COPIES TO:

Project Director
Research Administrative Network
Research Property Management
Accounting
Procurement/EES Supply Services
Research Security Services
Reports Coordinator (OCA)
Research Communications (2)
GTRI
Library
Project File
Other I. Newton

FORM OCA 4-383

GEORGIA INSTITUTE OF TECHNOLOGY OFFICE OF CONTRACT ADMINISTRATION

SPONSORED PROJECT TERMINATION/CLOSEOUT SHEET

SR6432-

Date 7/12/84

Project No. A-3502 ~~School~~/Lab RAIL-IMD

Includes Subproject No.(s)

Project Director(s) N.C. Currie GTRI / ~~GIT~~

Sponsor Canadian Department of Supply & Services

Title Radar Support for RCS Measurements of Sea Ice

Effective Completion Date: 4/15/83 * (Performance) 4/15/83 * (Reports)

* Charges on this project are allowable through July 1983.

Grant/Contract Closeout Actions Remaining:

- [x] None
- [ ] Final Invoice or Final Fiscal Report
- [ ] Closing Documents
- [ ] Final Report of Inventions
- [ ] Govt. Property Inventory & Related Certificate
- [ ] Classified Material Certificate
- [ ] ~~Other~~

Continues Project No. Continued by Project No.

COPIES TO:

Project Director
Research Administrative Network
Research Property Management
Accounting
Procurement/EES Supply Services
Research Security Services
Reports Coordinator (OCA)
Legal Services
Library
GTRI
Research Communications (2)
Project File
Other I. Newton

Form OCA 60:1028

ENGINEERING EXPERIMENT STATION
Georgia Institute of Technology
A Unit of the University System of Georgia
Atlanta, Georgia 30332

21 April 1983

Mr. Ed Lewis
Department of Fisheries and Oceans
867 Lakeshore Road, P. O. Box 5050
Burlington, Ontario
L7R 4A6

Reference: Contract No. OSE-82-00241

Subject: Monthly Technical Status Report No. 1 on Contract OSE-82-00241 (Georgia Tech Project A-3502) Covering the Period 22 February through 31 March 1983

Gentlemen:

This monthly status report covers the technical efforts and status of work performed under the referenced contract for the performance period 22 February through 31 March 1983.

Technical Efforts

Technical efforts during the month of March have concentrated on assembly and checkout of the Ku- and Ka-band instrumentation radars, construction of the digital interface between the radars and the NOVA 2 Computer, and development of the control and data analysis software for the NOVA 2.

The 35 GHz radar was assembled and checked out using a small corner reflector. Also, new TRG mixer/preamps were installed to improve the performance of the receiver.

The 16 GHz radar was repackaged into a 19" by 36" rack, and preliminary checkout was performed. The system transmitter and receiver appear to operate acceptably although the radar has not been checked out as a total system as of yet.

The design for the digital interface between the NOVA and the various radars was completed and construction was begun. Larry Briddle of McMaster University visited Georgia Tech on 1 March 1983 to "iron out" final interface details. It was decided to only interface the NOVA to the analog output devices since the digital interface to the McMaster Digital Tape recorder is too complex for the remaining available time. The NOVA interface will consist of an eight channel sample and hold circuit which will

provide "boxcarred" signals to the NOVA A-to-D converter. The sample and hold circuit will be triggered from a NOVA controlled range/azimuth trigger for data sampling. This setup will allow the NOVA to digitize data from any of the available on-site radars or from analog recorders.

Plans for the Next Reporting Period

During the next reporting period the radar systems will be completely checked out, the NOVA hardware and software will be completed, and all of the equipment will be shipped to Canada. The Georgia Tech personnel will depart for Canada on approximately 26 April and will depart for Frobisher Bay on or about 1 May 1983.

Financial Status

Expenditures on the contract for the month of March were $13,846 leaving $48,968 in the contract. Expenditures were light during March because of a late start on the contract and will increase significantly for April.

Respectfully submitted,

Nicholas C. Currie
Project Director

Approved:

J. L. Eaves
Associate Director
Radar and Instrumentation Laboratory

ENGINEERING EXPERIMENT STATION
Georgia Institute of Technology
A Unit of the University System of Georgia
Atlanta, Georgia 30332

13 May 1983

Mr. Ed Lewis
Department of Fisheries and Oceans
867 Lakeshore Road, P. O. Box 5050
Burlington, Ontario
L7R 4A6

Reference: Contract No. OSE-82-00241

Subject: Monthly Technical Status Report No. 2 on Contract OSE-82-00241 (Georgia Tech Project A-3502) Covering the Period 1 April through 29 April 1983

Gentlemen:

This monthly status report covers the technical efforts and status of work performed under the referenced contract for the performance period 1 April through 29 April 1983.

Technical Efforts

Development, integration, and checkout of the equipment were completed, and the equipment was shipped on 27 April 1983. The equipment shipped included three radars, a NOVA 2 computer, and miscellaneous equipment.

Georgia Tech personnel (N. C. Currie, J. T. Callahan, and R. C. Lott) departed for Hamilton, Ontario on 28 April 1983. Personnel will depart for Baffin Island on 1 May 1983.

Plans for the Next Reporting Period

During the next reporting period, the measurements of sea ice will be completed, the equipment will be shipped to Georgia Tech, and Georgia Tech personnel will return to Atlanta.

Financial Status

Expenditures on the contract for the month of April were $34,990 leaving $13,978 in the contract. Expenditures were high during April because equipment and personnel were transported to Canada for the start of field operations.

Respectfully submitted,

N. T. Alexander
Acting Division Chief, IMD

Approved:

J. L. Eaves
Associate Director
Radar and Instrumentation Laboratory

A-3502

Georgia Institute of Technology
ENGINEERING EXPERIMENT STATION
Atlanta, Georgia 30332

29 June 1984

Mr. Ed Lewis
Department of Fisheries and Oceans
867 Lakeshore Road, P.O. Box 5050
Burlington, Ontario
L7R4A6

Reference: Contract No. OSE-82-00241

Subject: Final Letter Report on Contract OSE-82-00241 (Georgia Tech Project A-3502)

Gentlemen:

This final letter report summarizes the technical efforts on Tasks 1 and 2 under the subject contract.

The contract began in mid-March 1983. Technical efforts during the month of March concentrated on assembly and checkout of the K_u- and K_a-band instrumentation radars, construction of the digital interface between the radars and the NOVA 2 Computer, and development of the control and data analysis software for the NOVA 2.

The 35 GHz radar was assembled and checked out using a small corner reflector. Also, new TRG mixer/preamps were installed to improve the performance of the receiver.

The 16 GHz radar was repackaged into a 19" by 36" rack, and preliminary checkout was performed. The system transmitter and receiver appear to operate acceptably although the radar has not been checked out as a total system as of yet.

The design for the digital interface between the NOVA and the various radars was completed and construction was begun. The NOVA interface will consist of an eight channel sample and hold circuit which will provide "boxcarred" signals to the NOVA A-to-D converter. The sample and hold circuit will be triggered from a NOVA controlled range/azimuth trigger for data sampling. This setup will allow the NOVA to digitize data from any of the available on-site radars or from analog recorders.

The Georgia Tech field crew and equipment departed from Hamilton, Ontario with the Canadian test team aboard a 748 cargo aircraft on 2 May 1983. The test team reached Pond Inlet, N.W.T. by evening and spent the night. The equipment and supplies were loaded onto a twin Otter aircraft the next day for transport to the Borden Station. Six trips were required to transport the equipment which took most of the day.

The next day unpacking and setup of equipment was begun and continued for several days, and various equipment problems which were encountered were resolved. During the tests the NOVA 2 minicimputer was interfaced to the radar video outputs from the various test radars via a computer controlled range gate and an A-to-D converter. The standard mode of operation involved moving the range gate in small steps from 0 to 10 mni while the antenna was fixed along a desired radial. In addition, radar "maps" of the sea ice were obtained by recording data for a fixed range while scanning, stepping the range gate out in range by 0.25 of pulse length, recording data for a scan and so on, until a radar map of the return for 360^{o} by 10 nmi in radius was obtained.

Radial lines were recorded for S-band, HH polarization, X-band, HH and HV polarizations, K_u-band, HH, HV, VH, and VV polarizations, and K_a-band, HH, HV, VH, and VV polarizations. Full radar area maps were obtained for X-band, K_u-band, and K_a-bands. No X-band coherent data were obtained due to failure of the high power TWT in the radar.

Georgia Tech personnel departed the Borden Radar Site on 25 May 1983 and arrived back in Atlanta on 27 May 1983.

Due to the failure of one of the digital tape drives in the field, it was impossible to duplicate the digital tapes prior to leaving the Borden Radar Site. Thus, the first task we completed after all equipment was returned from Canada was to duplicate the tapes. The original tapes and one copy were returned to the Canadian Department of Fisheries and Oceans. The second task involved making plots of the digitally stored range profiles, since that could not be completed in the field. The final task involved preparation of a final report discussing the tests and making recommendations concerning future tests.

Respectfully submitted,

N. C. Currie, Chief
Instrumentation and Measurements Division

Approved:

J. L. Eaves, Associate Director
Radar and Instrumentation Laboratory